Notice of Allowability	Application No.	Applicant(s)	
	10/810,685	SHEMESH ET AL.	
	Examiner	Art Unit	
	Charles Chow	2618	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *8/24/2007*.

2. ☒ The allowed claim(s) is/are *40-57*.

3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a) ☐ All b) ☐ Some* c) ☐ None of the:
      1. ☐ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
      3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
   (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☒ Interview Summary (PTO-413), Paper No./Mail Date *8/29/07 & 9/4/07* .
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

Detailed Action

1. This office action is for amendment received on 8/24/2007.

EXAMINER'S AMENDMENT

2. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment has been given from attorney Caleb Pollack in a telephone interview on September 4, 2007, for correcting the dependency of claim 45 upon a cancelled claim 22, and for amending claim 40, as following:

In line 1 of claim 45, replacing "22" with -----40-----.

In line 5 from the last line of claim 40, replacing the word, "fifth", before "sections", with -------sixth--------, for a first logic level.

Allowable Subject Matter

3. The following is an examiner's statement of reasons for allowance:

Claims 40-57 are allowable over the prior art of record. The prior arts fail to teach the allowable features, singly, particularly, or in combination or rendering obviousness.

Applicant has canceled rejected claims 1-39 and adding new claims 40-57 having allowable limitations in the independent claims 40, 49, 54 [equivalently shown in applicant's Fig. 1-4].

The dependent claims are also allowable due to their dependency upon the allowable independent claims 40, 49, 54 and the having additional claimed features.

The cited prior arts fail to teach the limitation features in independent **claim 40**, for the

producing a periodic output signal by mixing, subtracting, the three times a local oscillator frequency from the rf input frequency, utilizing delayed version of local oscillator signal, together with the positive/negative logic level signals [outputs 123N-122N from the signal shaper 143-152, applicant's Fig. 1] & the logic operation [140], the method comprising

the producing a first periodic logic signal having relatively high spectral content at three times the local frequency and relatively low spectral content at other frequencies,

from the first periodic signal and the delayed versions thereof using logic operations, wherein said first logic signal comprises eight periodic sections, and wherein said first, third, fourth, and fifth sections arc at a first logic level and

said second, fifth, seventh, and eighth sections arc at a second logic level opposite said first logic level.

producing the first periodic output signal by mixing the first periodic input signal with said first logic signal.

The cited prior arts fail to teach the limitation features in independent **claim 49**, for the method for producing a periodic differential output signal having a dominant spectral component at three times a local frequency less a center frequency by mixing three periodic differential signals having the local frequency and a periodic differential input signal having the center frequency in a circuit comprising four branches,

wherein each branch comprises three serially connected transistors, and wherein the second signal and the third signal are delayed from the first signal, the method comprising:

receiving a positive portion of the three signals in the first and the second branches,

wherein in each branch the first transistor receives the positive portion of the first

signal, the second transistor receives the positive portion of the second signal, and the third transistor receives the positive portion of the third signal;

receiving a negative portion of the three signals in the third and the fourth branches,

wherein in each branch the first transistor receives the negative portion of the first signal, the second transistor receives the negative portion of the second signal, and the third transistor receives the negative portion of the third signal;

receiving a positive portion of the input signal in a first transistor connected to the first branch and the third branch and a negative portion of the input signal in a second transistor connected to the second branch and the fourth branch; and

producing a positive portion of the output signal from the first branch and the fourth branch and a negative portion of the output signal from the second branch and the third branch.

The cited prior arts fail to teach the limitation features in independent **claim 54**, for the A method for producing a periodic differential output signal having a dominant spectral component at three times a local frequency less a center frequency by mixing three periodic differential signals having the local frequency **and a periodic differential input signal** having the center frequency in a circuit comprising a ring having four branches connected by nodes,

wherein each branch comprises three stacked transistors, and wherein the second signal and the third signal are delayed from the first signal, the method comprising:

receiving a positive portion of the three signals in the first branch and the second branch opposite thereto, wherein in each branch the first transistor receives the positive portion of the first signal, the second transistor receives the positive portion of the second signal, and

the third transistor receives the positive portion of the third signal;

receiving a negative portion of the three signals in the third branch and the fourth branch opposite thereto, wherein in each branch the first transistor receives the negative portion of the first signal, the second transistor receives the negative portion of the second signal, and the third transistor receives the negative portion of the third signal;

receiving a positive portion of the input signal in the node connecting the second branch and the third branch and a negative portion of the input signal in the node connecting the first branch and the fourth branch; and

producing a positive portion of the output signal from the node connecting the first branch and the third branch and a negative portion of the output signal from the node connecting the second branch and the fourth branch.

The closest prior art, **Dexter [US 6,654,595 B1]** teaches the switching network 150 [Fig. 3], the logic on/off state of the 160/170 [col. 12, lines 53-56], the two pairs of local oscillator signals from squaring gates[310/312], the reference signals from 40a, the output mixer 36a. the logic in Fig. 29. Dexter fails to teach the above highlighted allowable features.

Nguyen et al. [US 6,801,585 B1] teaches the gates in 721 applied logic operation to A/410 & B/delayed 420 [col. 5, lines 5-7, Fig. 7/Fig. 4B, Fig. 6A/Fig. 6B, col. 4, line 56 to col. 5, line 8], and

Cook et al. [US 2007/0015,471 A1] teaches the LO output. 15.45 GHz, from mixer 622 is at three time the LO frequency of 5.15 GHz in Fig. 6]; the output frequency from 606/612 is the difference of rf input to mixer at 0.95-1.7 GHz less the LO frequency at 15.45 GHz [Fig. 6; paragraph 0002], but Nguyen & Cook fail to teach the above highlighted allowable features.

Other prior arts in below are also considered, but they fail to teach the above allowable features.

Kohama [US 5,812,939] teaches the four branches in Fig. 8 for the FET transistor switches.

Sorrells et al. [US 6,704,558 B1] teaches the sine wave to square wave converter 310 in Fig. 3.

Namura [Us 7,079,596 B1] teaches the exclusive or citcuit 413 in Fig. 1 for generating local oscillator signal to mixer 610,156.

Lee et al. [US6,512,408 B2] teaches the multi-phase local oscillator signal generation with plurality of delayed local oscillator signals LO(0) to LO(N-1) for combine at 200B for the mixer 200A [Fig. 2B, Fig. 4A to Fig. 4F & its corresponding description in the specification].

Other prior arts are also considered. They are: **Otaka [US 6,148,181], Scherer et al. [US 5,844,939], Wang [US 6,529,052 B2], Craninckx [US 2005/0148,310 A1], Hashimoto et al. [US 5,262,735], Pengelly et al. [US 5,898,913], Petro et al. [US 7,139,546], Dornbusch [US 2005/0266,821 A1], Puechberty et al. [US 6,026,287], Dai et al. [US 6,469,585 B1].**

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Charles C. Chow whose telephone number is (571) 272-7889. The examiner can normally be reached on 8:00am-5:30pm. If attempts to reach the examiner by

telephone are unsuccessful, the examiner's supervisor, Edward Urban can be reached on (571) 272-7899. The fax phone number for the organization where this application or

proceeding is assigned is (571) 273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Charles Chow C.C.

September 4, 2007.

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